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Traffic Assessment

**McDonald's Restaurant
Amesbury, Massachusetts**

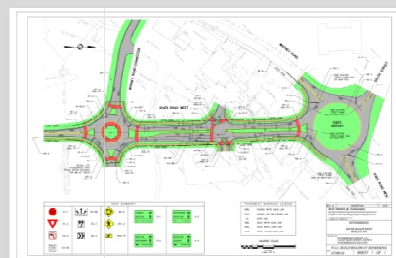
Prepared for:

**Bohler Engineering
352 Turnpike Street
Southborough, MA 01772**

November 2, 2016



Quality



Accuracy



Integrity





Traffic Assessment

To: Mr. Eric Dubrule
Bohler Engineering
352 Turnpike Street
Southborough, MA 01772

Reg: McDonald's Restaurant
84 Macy Street
Amesbury, MA

From: Ron Müller, P.E., Principal

Date: November 2, 2016
Project #: 16040

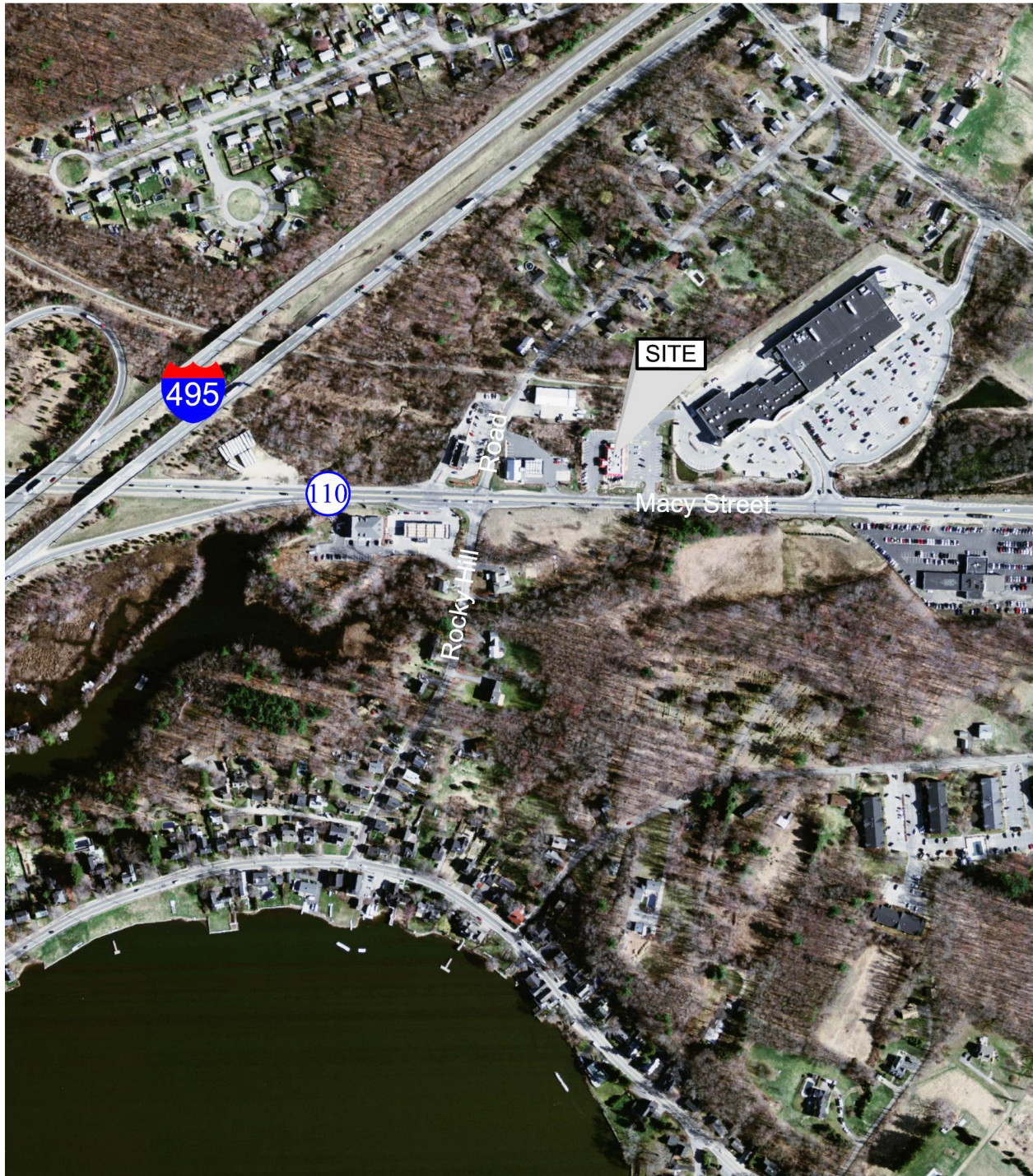
INTRODUCTION

Ron Müller & Associates (RMA) has conducted this Traffic Assessment for the proposed redevelopment of the existing McDonald's restaurant located at 84 Macy Street (Route 110) in Amesbury, Massachusetts. The project consists of razing the existing 4,214 square foot, 139-seat McDonald's restaurant and constructing a new 4,703 square foot McDonald's with 106 seats, including 24 outdoor seats. The site currently provides an entrance-only and a separate exit-only driveway on Route 110 as well as a rear connection with the Carriagetown Marketplace that provides a signalized driveway onto Route 110. No change in site access is proposed. However, on-site circulation improvements are proposed as described herein. The site location with respect to the surrounding roadways and land uses is shown on Figure 1.

This report has been prepared to estimate if any increase in traffic would result from site redevelopment, assess the safety of the site driveways, and provide a review of on-site circulation changes. As documented in this report, the existing McDonald's restaurant generates more traffic than industry-standard trip generation rates would suggest. This is likely due to the fact that the site is located in close proximity to both the I-495 and I-95 interchanges with Route 110 and draws a substantial portion of its traffic from these interstate highways. Accordingly, redevelopment of the site is not expected to result in an increase in traffic, particularly since the number of seats within the building will actually be reduced.

Since reconstruction of Route 110 when the road was widened to provide two lanes per direction with an exclusive left-turn lane into the McDonald's driveway, there have been only two accidents per year at the McDonald's driveways, on average, and the calculated crash rate is well below the statewide average. The existing McDonald's driveways are therefore not indicative of any safety concerns.

Figure 1
Site Location Map



With removal (or trimming) of the landscaping located just to the west of the exit driveway, ample sight distances will exist at this driveway exceeding the minimum requirements and safe operation can therefore be expected. It is recommended that any proposed landscaping or signs in the vicinity of the exit driveway be kept low to the ground or outside the sight triangles so as not to impede the available sight distances.

On-site circulation improvements are proposed that will have a significant benefit on traffic operations by giving customers a choice on where to exit the site and potentially reduce the number of left turns out of the McDonald's driveway. The new McDonald's will provide queue storage for at least 13 vehicles within the marked drive-through lane, exceeding the recommended queue storage for fast-food establishments.

Although the site abuts and accesses onto a state highway (Route 110), the project will not require a Highway Access Permit from the Massachusetts Department of Transportation (MassDOT) as no changes to the driveways are proposed and the redevelopment project does not exceed any of the review thresholds that could require such a permit. The project will also not require any Massachusetts Environmental Policy Act (MEPA) review as the project size and traffic generation are well below the MEPA review thresholds and no state permit is required. The redevelopment project is in compliance with the development and performance standards of the Amesbury Zoning Bylaws regarding site access and traffic impacts.

TRAFFIC VOLUMES

Traffic counts were conducted on Route 110 adjacent to the site to determine current traffic levels and the percentage increase in traffic that redevelopment of the site will have, if any. These counts were collected using an automatic traffic recorder (ATR) to collect weekday and Saturday daily and peak hour volumes and were performed from Thursday September 29 through Saturday October 1, 2016. The count data indicate that the weekday AM peak hour typically occurs from 7:30 to 8:30 AM, the weekday PM peak hour typically occurs from 4:45 to 5:45 PM, and the Saturday midday peak hour from 11:30 AM to 12:30 PM. The count data are provided in the Appendix.

To determine if the data needed to be adjusted to represent annual average month conditions consistent with state guidelines for traffic impact assessment, historical traffic volume data were obtained from MassDOT. Based on the closest permanent traffic count station to the project site (Station 5087 located on I-95 in Salisbury at the Amesbury Town Line), traffic during the months of September and October are between 2 and 7 percent higher than annual average month traffic conditions. Therefore, to present a conservative analytical scenario, no seasonal adjustments were made to the collected data. A summary of the existing count data is provided in Table 2 and the MassDOT seasonal adjustment factors are provided in the Appendix.

Table 2
Existing Traffic Volume Summary

Location	Daily Volume ^a	Peak Hour Volume ^b	K-Factor ^c	Directional Distribution ^d
Route 110 Adjacent to the Site				
Weekday	28,280	AM: 2,147 PM: 2,392	7.6% 8.5%	61% EB 54% WB
Saturday	19,570	Midday: 1,474	7.5%	61% EB

^a In vehicles per day;

^b In vehicles per hour from TMCs;

^c Percentage of daily traffic occurring during the peak hour;

^d EB = eastbound, WB = westbound.

ACCIDENTS

Accident data for the site driveway intersections with Route 110 were obtained from MassDOT for the period between 2012 and 2014, the latest three years of available data. A summary of the MassDOT accident data is provided in Table 2. In addition to the summary, accident occurrence should also be compared to the volume of traffic through a particular intersection to determine any significance. Accordingly, the accident rate was calculated for the intersections and compared with the statewide and district-wide averages.

An intersection accident rate is a measure of the frequency of accidents compared to the volume of traffic through an intersection and is presented in accidents per million entering vehicles (acc/mev). For unsignalized intersections, the statewide average accident rate is 0.58 acc/mev and the district-wide accident rate is 0.56 acc/mev. A comparison of the calculated accident rate to the statewide and district-wide averages can be used to establish the significance of accident occurrence and whether or not potential safety problems exist. The crash rate worksheets are provided in the Appendix. It should be noted that the MassDOT database were not detailed enough to differentiate between the enter-only and exit-only driveways and the results shown in Table 2 include both driveways.

Table 2
Accident Summary

Location	Number of Accidents					Severity ^a			Accident Type ^b			% During Wet/Icy Conditions
	2012	2013	2014	Avg./ Year	Accident Rate ^c	PD	PI	F	CM	RE	FO	
Route 110 at McDonald's Driveways	10	1	3	4.7	0.45	11	3	0	6	6	2	14%

Source: MassDOT Traffic Operations Safety Management System – 2012 through 2014 data.

^a PD = property damage only; PI = personal injury; F = fatality.

^b CM = cross movement/angle; RE = rear end; FO = fixed object.

^c Measured in accidents per million entering vehicles.

As this table demonstrates, there were a total of 10 reported collisions at the McDonald's driveways in 2012 and only one collision in 2013 and three in 2014. Significant improvements were made to Route 110 that were completed in October 2012, including widening of the road to provide two travel lanes per direction and provision of an exclusive left-turn lane for turns into the McDonald's. It is therefore reasonable to conclude that the improvements significantly reduced accident incidence at the McDonald's driveways. Although the calculated crash rate even with the 2012 data is still lower than the statewide and district-wide averages, the number of accidents in 2013 and 2014 after the improvements were completed indicate a crash rate of only 0.19 acc/mev, significantly lower than the average. In addition, one of the three accidents in 2014 involved a vehicle making a U-turn at the Route 110 median and had nothing to do with the McDonald's driveway. Therefore, the existing McDonald's driveways are not indicative of any safety concerns and no particular trends in accident incidence were apparent.

TRIP GENERATION

To establish the current traffic generation of the McDonald's restaurant, traffic counts were conducted at each of the site driveways on Thursday September 29 and on Saturday October 8, 2016. These counts were collected during the weekday AM peak period (7:00 to 9:00 AM), the weekday PM peak period (4:00 to 6:00 PM), and the Saturday midday peak period (11:00 AM to 2:00 PM). The peak hour site traffic generation during each of these time periods is summarized in Table 3.

These counts were then compared with the trips expected to be generated by the new McDonald's restaurant. Although the number of seats will actually be reduced in the new building, the overall building size will increase slightly. Accordingly, the traffic generation of

the new building was estimated using the 9th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*.¹ ITE Land Use Code 934 (Fast-Food Restaurant with Drive-Through window) trip rates were applied to the proposed building size and the resulting trip estimates are also shown in Table 3. It should be noted that although the ITE manual also provides trip estimates based on the number of seats, use of this variable would produce even lower trip estimates. The trip generation calculations are provided in the Appendix.

Table 3
Trip Generation Comparison

Time Period	Existing McDonald's ^a	Proposed McDonald's ^b
Weekday AM Peak Hour		
Enter	195	109
<u>Exit</u>	<u>195</u>	<u>105</u>
Total	390	214
Weekday PM Peak Hour		
Enter	153	80
<u>Exit</u>	<u>147</u>	<u>74</u>
Total	300	154
Saturday Peak Hour		
Enter	155	141
<u>Exit</u>	<u>162</u>	<u>136</u>
Total	317	277

^a Peak hour trips from traffic counts conducted at the site driveways.

^b ITE Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) for 4,703 sf.

As shown, the existing McDonald's restaurant generates more traffic than the ITE would suggest, even for the new larger building size. This is likely due to the fact that the site is located in close proximity to both the I-495 and I-95 interchanges with Route 110 and draws a substantial portion of its traffic from these interstate highways. Both highways post food service signs prior to the Route 110 interchanges advising motorists of the McDonald's location. Accordingly, redevelopment of the site is not expected to result in an increase in traffic, particularly since the number of seats within the building will actually be reduced.

¹ *Trip Generation Manual, 9th Edition*; Institute of Transportation Engineers; Washington, DC, 2012.

TRIP DISTRIBUTION

Based on the peak period traffic counts conducted at the existing McDonald's driveways, approximately 60 percent of the site traffic is currently oriented to/from the west on Route 110 and 20 percent to/from the east. The remaining 20 percent of site traffic uses the rear connector to/from the Carriagetown Marketplace. With redevelopment of the site, it is likely that more site traffic will utilize the rear connector to access the traffic signal at the Carriagetown Marketplace, as described later in this report. This will reduce the volume of traffic turning left from the exit driveway onto Route 110. As the project is not expected to increase the volume of peak hour traffic generated by the site, there will be no increase in traffic on Route 110.

MASSDOT AND MEPA THRESHOLDS

The site abuts and has access on a state highway (Route 110). Although no changes in site access are proposed, redevelopment of the site could require a Highway Access Permit from the MassDOT District 4 office and consequently could also require review and approval through the MEPA office if one or more of the following review thresholds are exceeded:

- Generation of 2,000 or more daily vehicle trips
- Creation of 300 or more new parking spaces
- Generation of 1,000 or more daily vehicle trips plus 150 or more parking spaces

As shown in Table 1, the project will not result in an increase in peak hour traffic. However, since both MEPA and MassDOT thresholds are typically established using ITE trip rates, a comparison was made between the existing and proposed McDonald's building sizes to determine any potential increase in weekday daily traffic. This comparison, which is provided in the Appendix, shows that the increase in building size could generate 240 additional weekday daily trips. These trip increases are well below any established trip threshold. Based on the site plan prepared by Bohler Engineering, redevelopment of the site as proposed will result in a reduction in parking of 10 spaces. Therefore, the project will not exceed any of the above review thresholds and a Highway Access Permit from MassDOT will not be required. Since no state permits are needed for the project, MEPA review will also not be required.

VEHICLE SPEEDS

Speed measurements were conducted along Route 110 adjacent to the site by measuring the elapsed time for vehicles traveling a short, pre-measured distance between two checkpoints. The travel time is recorded using the ATRs and the speed is derived by dividing the elapsed time into

the measured distance between checkpoints. The results of the speed measurements are summarized in Table 4 and speed data are provided in the Appendix.

Table 4
Observed Travel Speeds ^a

Location/Direction	Posted Speed Limit	Average Speed	85 th Percentile Speed ^b
Route 110 Adjacent to the Site:			
Eastbound	45	35	41
Westbound	45	34	41

^a In miles per hour (mph).

^b Speed at, or below which 85 percent of all observed vehicles travel.

As shown in Table 4, both average and 85th percentile recorded speeds on Route 110 adjacent to the site are below the posted speed limit of 45 miles per hour. The posted speed limit was therefore used to calculate the sight distance requirements, as discussed below.

SIGHT DISTANCE

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the existing exit driveway to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).² AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. MassDOT and the Executive Office of Energy and Environmental Affairs (EEA) require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessment.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of

²A *Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2004.

2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the existing exit driveway were measured and compared to minimum requirements as established by AASHTO. The SSD and ISD requirements at the driveway intersections were calculated based on the posted speed limit, as observed 85th percentile speeds were found to be lower than the posted limit. The required minimum sight distances for these speeds are compared to the available distances, as shown in Table 5.

Table 5
Sight Distance Summary

Location/Direction	Sight Distance (feet)		
	Measured	Minimum Required (SSD) ^a	Desirable (ISD) ^b
Route 110 at Exit Drive:			
East of intersection	500+	360	500
West of intersection	500+ ^c	360	500

^a Values based on AASHTO SSD requirements for posted speed limit of 45 mph on Route 110.

^b Values based on AASHTO ISD requirements for posted speed limit of 45 mph on Route 110.

^c The measured sight line assumes the trimming or removal of landscaping immediately to the west of the driveway.

As shown in the table, ample sight distances exist at the exit driveway, exceeding both minimum requirements and desirable distances and safe operation of the driveway can therefore be expected. It is important to note that the available sight line to the west of the driveway assumes the trimming or clearing of overgrown landscaping located within the Route 110 right-of-way and immediately to the west of this driveway. This sight distance obstruction is shown on Figure 2. It is therefore recommended that this landscaping be removed (or trimmed) within the Route 110 layout and that any proposed landscaping or signs in the vicinity of the site driveway be kept low to the ground (less than 3 feet above street level) or outside the sight triangles (as defined by AASHTO) so as not to impede the available sight distances.

Figure 2
Existing Sight Distance Obstruction



SITE ACCESS & ON-SITE CIRCULATION

No changes in access to the site are proposed and the project will continue to be served by the existing entrance-only driveway on Route 110, the exit-only driveway on Route 110, and the rear connection to the Carriagetown Marketplace shopping center that has a signalized driveway on Route 110. This rear connection allows McDonald's traffic destined to the east on Route 110 to travel through the shopping center and make a safe left turn onto Route 110 at the signal.

However, on-site circulation changes are proposed that will significantly improve circulation and access. Most important among those are the elimination of the existing play area in front of the building where a one-way connection will instead be made to allow site traffic to circulate back into the main parking field and access the rear connector to the adjacent shopping center. Currently, all drive-through traffic as well as any cars parked on the west side of the building must exit onto Route 110. This condition creates additional left-turn movements onto Route 110 than necessary. Under the new plan, these vehicles will be able to circulate around the building, re-enter the main parking area, and use the rear connection to the Carriagetown Marketplace where access to the signalized intersection with Route 110 is provided. This should result in a reduction in the number of left turns from the McDonald's driveway onto Route 110.

The existing drive-through lane provides queue storage for approximately 11 vehicles with space for 4 vehicles between the order board and the pick-up window. The new McDonald's will provide queue storage for at least 13 vehicles within the marked drive-through lane with two order boards, a pay window, and a separate pick-up window that is located approximately 9 vehicles from the order boards, thereby allowing more time for employees to prepare the meals. This arrangement allows faster processing of customers that should also reduce queuing in the drive-through lane. A published study³ of drive-through queuing characteristics at a number of different land uses found that fast food restaurants should be designed to accommodate a 12 vehicle queue within the drive-through lane. Accordingly, the proposed drive-through lane is sufficient to accommodate the expected demand, particularly with the added amenities including the two order boards and separate pay and pick-up windows.

COMPLIANCE WITH AMESBURY ZONING BYLAWS

Section 8.a. (Access and Traffic Impacts) of the Amesbury Zoning Bylaws specifies that applications must demonstrate that the project will minimize traffic and safety impacts on City roads. The specific requirements of this section are paraphrased below, followed by a discussion of how the proposed project complies:

1. *The number of curb cuts on state and local roads shall be minimized.* No change in site access is proposed and the site will continue to be served by an enter-only driveway and an exit-only driveway on Route 110 as well as a cross connection to the adjacent Carriagetown Marketplace. A review of MassDOT accident records indicates that these driveways are not indicative of any safety concerns with crash rates well below the statewide average.
2. *One access drive per development site shall be permitted.* Although the site provides two curb cuts on Route 110, they effectively function as one driveway as one curb cut is an enter-only driveway and the other curb cut is an exit-only driveway. Therefore,

³ *Drive-Through Queue Generation*; Mike Spack, PE, PTOE; CountingCars.com; February 2012.

- the two curb cuts do not produce any more conflicting turning movements than a single driveway. A review of MassDOT accident records indicates that these driveways are not indicative of any safety concerns with crash rates well below the statewide average.
3. *Curb cuts shall not exceed 24 feet in width.* The existing exit-only curb cut is 24 feet in width and complies with this requirement. The existing enter-only curb cut is approximately 36 feet in width at the street line. This width is necessary to allow McDonald's tractor-trailer delivery vehicles to make a right turn into the driveway without having to use both westbound travel lanes on Route 110. A review of MassDOT accident records indicates that these driveways are not indicative of any safety concerns with crash rates well below the statewide average.
 4. *All driveways shall be designed to allow safe sight distances.* As demonstrated in this study, ample sight distances will be provided with the trimming or clearing of overgrown landscaping located within the Route 110 right-of-way and immediately to the west of the exit driveway.
 5. *The proposed development shall assure safe interior circulation within the site by separating pedestrian and vehicular traffic.* As described in this study, significant improvements to on-site circulation are proposed including the provision of a one-way connection at the front of the building to allow site traffic to circulate back into the main parking field and access the rear connector to the adjacent shopping center. This will allow exiting site traffic access to the signalized intersection with Route 110 and should result in a reduction in the number of left turns from the McDonald's driveway onto Route 110. In addition, significant pedestrian improvements are proposed including a walkway connection with the existing sidewalk along Route 110, construction of sidewalks along the east and south sides of the building to allow safe access to all entry ways and the outdoor patio area, and provision of crosswalks connecting the proposed sidewalks and parking areas.
 6. *Provide a detailed traffic assessment for all new buildings in excess of 3,000 square feet.* This study serves to satisfy this requirement.
 7. *Adequate pedestrian and bicycle access shall be provided via sidewalks to allow access to adjacent properties.* A sidewalk is currently provided along Route 110 that connects the McDonald's with adjacent properties and a new walkway is proposed to connect the McDonald's restaurant with the existing sidewalk.
 8. *The anticipated impacts of a proposed development and the effects of proposed mitigation should be evaluated.* As described herein, the project will not increase the volume of traffic generated by the McDonald's restaurant. Accordingly, the redevelopment project will not create any additional traffic impacts that could require traffic mitigation.

9. *Regardless of project size or traffic generation, measured sight distances at access/egress locations within public ways shall, at a minimum, meet MassDOT and AASHTO standards for safe stopping sight distance.* As demonstrated in this study, with the trimming or clearing of overgrown landscaping located just west of the exit driveway, both stopping sight distance and intersection sight distance criteria will be exceeded.
10. *Adjacent commercial uses shall share access points and provide connections between parcels so as to minimize curb cuts, driveways, and vehicular turning movements.* The existing connection between the McDonald's restaurant and the Carriagetown Marketplace will be maintained with the project. In fact, with the proposed site circulation improvements, it is expected that this cross-connection, which allows McDonald's traffic access to a signalized intersection with Route 110, will be utilized more and minimize the need to turn left from McDonald's directly onto Route 110.
11. *Internal site circulation shall be designed to accommodate the appropriate design vehicle for the project.* The site has been designed to accommodate McDonald's tractor-trailer delivery vehicles with a loading area provided at the rear of site that will not interfere with customer traffic. As described above, the width of the entrance driveway, which is 33.5 feet at its narrowest point, is required to allow these vehicles to make a right turn from Route 110 without using both westbound travel lanes. The exit driveway, which is 24 feet in width, is sufficient to allow delivery vehicles to make a right turn out as the vehicle can use both westbound lanes to make the turn.
12. *Roadway access for new development and redevelopment must be consistent with the functional classification of the road.* Route 110 adjacent to the site is classified as a rural minor arterial or urban principal arterial. MassDOT approved the curb cuts for the existing McDonald's restaurant. As no changes are proposed to the driveways and the redevelopment project will not increase site traffic generation, the access driveways will continue to be consistent with the functional classification of the road.

Based on the above, the redevelopment project is in compliance with the development and performance standards of the Amesbury Zoning Bylaws regarding site access and traffic impacts.

CONCLUSIONS

The project consists of razing the existing 4,214 square foot, 139-seat McDonald's restaurant and constructing a new 4,703 square foot McDonald's with 106 seats, including 24 outdoor seats. Based on traffic counts conducted at the McDonald's restaurant driveways, the existing McDonald's generates more traffic than industry-standard trip generation rates would suggest. This is likely due to the fact that the site is located in close proximity to both the I-495 and I-95

interchanges with Route 110 and draws a substantial portion of its traffic from these interstate highways, especially since both highways post food service signs prior to the Route 110 interchanges advising motorists of the McDonald's location. Accordingly, redevelopment of the site is not expected to result in an increase in traffic, particularly since the number of seats within the building will actually be reduced.

Since reconstruction of Route 110 when the road was widened to provide two lanes per direction with an exclusive left-turn lane into the McDonald's driveway, there have been only two accidents per year, on average, and the calculated crash rate is well below the statewide average. The existing McDonald's driveways are therefore not indicative of any safety concerns.

It is recommended that the existing landscaping located just to the west of the exit driveway and within the Route 110 right-of-way be removed or trimmed back outside the road layout. With removal of this vegetation, ample sight distances will exist at this driveway exceeding the minimum requirements and safe operation can therefore be expected. It is recommended that any proposed landscaping or signs in the vicinity of the exit driveway be kept low to the ground or outside the sight triangles so as not to impede the available sight distances.

No change in site access is proposed. However, on-site circulation improvements are proposed that will have a significant benefit on traffic operations; namely the provision of a one-way drive aisle in the front of the new building that will allow drive-through customers the ability to circulate back into the main parking area. By doing so, customers can access to the rear connector with the adjacent Carriagetown Marketplace, which provides a signalized driveway onto Route 110, where left turns onto Route 110 can be safely made. This should reduce the number of left turns out of the McDonald's driveway.

The new McDonald's will provide queue storage for at least 13 vehicles within the marked drive-through lane with two order boards and separate pay window and pick-up windows. This arrangement allows faster processing of customers that should also reduce queuing in the drive-through lane. Based on past studies of fast-food restaurants, the drive-through lane should be designed to accommodate 12 vehicles in queue.

Although the site accesses onto a state highway, the redevelopment project will not require a Highway Access Permit from MassDOT. Since no state permits are needed for the project, MEPA review will also not be required. The redevelopment project is in compliance with the development and performance standards of the Amesbury Zoning Bylaws regarding site access and traffic impacts.

APPENDIX

Traffic Count Data
Seasonal Adjustment Data
Crash Rate Worksheets
Trip Generation Worksheets

Accurate Counts

Location : Macy Street (Route 110)
 Location : West of McDonalds
 City/State: Amesbury, MA

978-664-2565

16040VL1

Start Time	9/29/2016 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		11	227			19	210				
12:15		8	223			9	212				
12:30		7	234			17	190				
12:45		10	205	36	889	13	215	58	827	94	1716
01:00		7	217			11	188				
01:15		11	216			8	190				
01:30		3	197			8	199				
01:45		8	223	29	853	8	209	35	786	64	1639
02:00		8	228			7	210				
02:15		10	219			10	213				
02:30		8	229			12	254				
02:45		7	265	33	941	5	252	34	929	67	1870
03:00		11	257			5	242				
03:15		7	258			7	308				
03:30		11	274			9	266				
03:45		15	270	44	1059	9	265	30	1081	74	2140
04:00		11	252			10	264				
04:15		20	275			15	272				
04:30		30	241			24	298				
04:45		37	259	98	1027	27	314	76	1148	174	2175
05:00		42	282			30	317				
05:15		58	272			23	350				
05:30		61	296			41	302				
05:45		89	229	250	1079	52	300	146	1269	396	2348
06:00		135	246			77	269				
06:15		213	229			102	266				
06:30		265	209			163	212				
06:45		334	176	947	860	181	202	523	949	1470	1809
07:00		271	159			185	193				
07:15		307	156			217	179				
07:30		319	139			195	142				
07:45		349	92	1246	546	201	125	798	639	2044	1185
08:00		306	113			228	137				
08:15		334	139			215	116				
08:30		299	105			208	111				
08:45		286	113	1225	470	192	97	843	461	2068	931
09:00		220	85			186	98				
09:15		207	70			194	111				
09:30		217	72			189	75				
09:45		232	65	876	292	175	71	744	355	1620	647
10:00		206	61			158	91				
10:15		184	42			186	56				
10:30		223	60			172	56				
10:45		207	50	820	213	172	41	688	244	1508	457
11:00		199	37			160	54				
11:15		173	26			169	48				
11:30		210	30			182	54				
11:45		219	23	801	116	162	34	673	190	1474	306
Total		6405	8345			4648	8878			11053	17223
Percent		43.4%	56.6%			34.4%	65.6%			39.1%	60.9%

Accurate Counts

Location : Macy Street (Route 110)
 Location : West of McDonalds
 City/State: Amesbury, MA

978-664-2565

16040VL1

Start Time	9/30/2016 Fri	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		15	279			34	194				
12:15		11	256			34	194				
12:30		13	287			21	187				
12:45		12	240	51	1062	26	180	115	755	166	1817
01:00		9	292			15	199				
01:15		10	286			13	194				
01:30		10	273			19	232				
01:45		14	268	43	1119	9	200	56	825	99	1944
02:00		13	249			10	188				
02:15		14	277			15	240				
02:30		9	262			10	244				
02:45		10	290	46	1078	5	228	40	900	86	1978
03:00		10	226			20	231				
03:15		8	272			11	303				
03:30		14	250			12	288				
03:45		18	256	50	1004	8	297	51	1119	101	2123
04:00		6	236			10	258				
04:15		24	240			20	305				
04:30		31	282			20	272				
04:45		40	268	101	1026	30	282	80	1117	181	2143
05:00		67	270			33	265				
05:15		118	261			50	300				
05:30		136	230			51	295				
05:45		177	235	498	996	78	266	212	1126	710	2122
06:00		140	233			88	255				
06:15		191	218			106	220				
06:30		240	182			155	230				
06:45		302	185	873	818	156	233	505	938	1378	1756
07:00		272	174			201	164				
07:15		292	151			223	191				
07:30		322	147			197	174				
07:45		349	126	1235	598	175	132	796	661	2031	1259
08:00		329	92			178	125				
08:15		345	122			200	96				
08:30		333	85			184	105				
08:45		350	89	1357	388	179	110	741	436	2098	824
09:00		285	124			160	115				
09:15		242	171			175	112				
09:30		230	86			177	117				
09:45		264	59	1021	440	169	96	681	440	1702	880
10:00		242	69			183	92				
10:15		266	68			180	84				
10:30		279	68			161	62				
10:45		246	62	1033	267	203	54	727	292	1760	559
11:00		312	46			153	72				
11:15		321	51			180	97				
11:30		256	28			182	69				
11:45		264	24	1153	149	176	52	691	290	1844	439
Total		7461	8945			4695	8899			12156	17844
Percent		45.5%	54.5%			34.5%	65.5%			40.5%	59.5%

Accurate Counts

Location : Macy Street (Route 110)
 Location : West of McDonalds
 City/State: Amesbury, MA

978-664-2565

16040VL1

Start Time	10/1/2016 Sat	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		24	223			37	148				
12:15		22	234			41	142				
12:30		17	216			31	152				
12:45		12	207	75	880	25	147	134	589	209	1469
01:00		19	215			27	141				
01:15		16	211			24	125				
01:30		15	219			22	144				
01:45		17	200	67	845	21	151	94	561	161	1406
02:00		8	197			14	144				
02:15		14	203			10	150				
02:30		10	198			13	131				
02:45		11	198	43	796	6	157	43	582	86	1378
03:00		9	193			10	180				
03:15		6	181			10	149				
03:30		8	174			5	134				
03:45		10	193	33	741	13	136	38	599	71	1340
04:00		10	173			4	165				
04:15		5	190			5	132				
04:30		15	181			8	145				
04:45		24	171	54	715	9	138	26	580	80	1295
05:00		23	159			14	158				
05:15		33	171			25	152				
05:30		43	147			24	153				
05:45		63	161	162	638	35	121	98	584	260	1222
06:00		49	155			29	134				
06:15		59	134			36	123				
06:30		86	147			52	109				
06:45		104	146	298	582	66	118	183	484	481	1066
07:00		82	111			61	110				
07:15		119	111			82	95				
07:30		116	91			84	100				
07:45		155	112	472	425	97	101	324	406	796	831
08:00		133	87			101	103				
08:15		182	82			101	109				
08:30		163	88			132	74				
08:45		192	67	670	324	139	94	473	380	1143	704
09:00		178	68			154	109				
09:15		183	62			141	85				
09:30		180	54			139	81				
09:45		167	61	708	245	155	78	589	353	1297	598
10:00		159	70			133	84				
10:15		192	69			139	82				
10:30		205	48			142	52				
10:45		221	57	777	244	161	67	575	285	1352	529
11:00		219	53			128	64				
11:15		202	33			166	60				
11:30		224	32			147	35				
11:45		218	39	863	157	138	37	579	196	1442	353
Total		4222	6592			3156	5599			7378	12191
Percent		39.0%	61.0%			36.0%	64.0%			37.7%	62.3%
Grand Total		18088	23882			12499	23376			30587	47258
Percent		43.1%	56.9%			34.8%	65.2%			39.3%	60.7%

ADT ADT 23,449 AADT 23,449

Location : Macy Street (Route 110)
Location : West of McDonalds
City/State: Amesbury, MA

978-664-2565

16040VL1

Start Time	9/26/2016		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	*	*	36	58	51	115	75	134	*	*	54	102
01:00	*	*	*	*	*	*	29	35	43	56	67	94	*	*	46	62
02:00	*	*	*	*	*	*	33	34	46	40	43	43	*	*	41	39
03:00	*	*	*	*	*	*	44	30	50	51	33	38	*	*	42	40
04:00	*	*	*	*	*	*	98	76	101	80	54	26	*	*	84	61
05:00	*	*	*	*	*	*	250	146	498	212	162	98	*	*	303	152
06:00	*	*	*	*	*	*	947	523	873	505	298	183	*	*	706	404
07:00	*	*	*	*	*	*	1246	798	1235	796	472	324	*	*	984	639
08:00	*	*	*	*	*	*	1225	843	1357	741	670	473	*	*	1084	686
09:00	*	*	*	*	*	*	876	744	1021	681	708	589	*	*	868	671
10:00	*	*	*	*	*	*	820	688	1033	727	777	575	*	*	877	663
11:00	*	*	*	*	*	*	801	673	1153	691	863	579	*	*	939	648
12:00 PM	*	*	*	*	*	*	889	827	1062	755	880	589	*	*	944	724
01:00	*	*	*	*	*	*	853	786	1119	825	845	561	*	*	939	724
02:00	*	*	*	*	*	*	941	929	1078	900	796	582	*	*	938	804
03:00	*	*	*	*	*	*	1059	1081	1004	1119	741	599	*	*	935	933
04:00	*	*	*	*	*	*	1027	1148	1026	1117	715	580	*	*	923	948
05:00	*	*	*	*	*	*	1079	1269	996	1126	638	584	*	*	904	993
06:00	*	*	*	*	*	*	860	949	818	938	582	484	*	*	753	790
07:00	*	*	*	*	*	*	546	639	598	661	425	406	*	*	523	569
08:00	*	*	*	*	*	*	470	461	388	436	324	380	*	*	394	426
09:00	*	*	*	*	*	*	292	355	440	440	245	353	*	*	326	383
10:00	*	*	*	*	*	*	213	244	267	292	244	285	*	*	241	274
11:00	*	*	*	*	*	*	116	190	149	290	157	196	*	*	141	225
Lane	0	0	0	0	0	0	14750	13526	16406	13594	10814	8755	0	0	13989	11960
Day	0	0	0	0	0	0	28276	28276	30000	30000	19569	19569	0	0	25949	25949
AM Peak Vol.	-	-	-	-	-	-	07:00	08:00	08:00	07:00	11:00	09:00	-	-	08:00	08:00
	-	-	-	-	-	-	1246	843	1357	796	863	589	-	-	1084	686
PM Peak Vol.	-	-	-	-	-	-	17:00	17:00	13:00	17:00	12:00	15:00	-	-	12:00	17:00
	-	-	-	-	-	-	1079	1269	1119	1126	880	599	-	-	944	993

Accurate Counts

Location : Macy Street (Route 110)

978-664-2565

Location : West of McDonalds

City/State: Amesbury, MA

16040SP1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/29/16	4	0	0	4	10	12	6	0	0	0	0	0	0	0	36
01:00	3	0	0	3	8	10	5	0	0	0	0	0	0	0	29
02:00	4	0	0	4	9	11	5	0	0	0	0	0	0	0	33
03:00	5	0	0	5	12	15	7	0	0	0	0	0	0	0	44
04:00	6	0	2	10	27	32	17	4	0	0	0	0	0	0	98
05:00	23	2	9	23	53	84	42	13	1	0	0	0	0	0	250
06:00	53	6	23	47	200	368	192	43	14	1	0	0	0	0	947
07:00	107	20	37	142	340	390	164	42	4	0	0	0	0	0	1246
08:00	57	3	41	125	354	442	175	25	3	0	0	0	0	0	1225
09:00	34	4	17	78	255	338	135	12	3	0	0	0	0	0	876
10:00	37	10	14	81	207	329	117	21	4	0	0	0	0	0	820
11:00	34	1	24	76	228	301	123	11	3	0	0	0	0	0	801
12 PM	40	3	25	100	279	324	106	12	0	0	0	0	0	0	889
13:00	55	8	26	95	232	307	113	17	0	0	0	0	0	0	853
14:00	40	0	23	73	273	363	143	25	1	0	0	0	0	0	941
15:00	46	2	20	99	302	387	183	20	0	0	0	0	0	0	1059
16:00	26	4	15	84	275	400	189	30	4	0	0	0	0	0	1027
17:00	46	2	11	76	263	441	204	33	3	0	0	0	0	0	1079
18:00	21	3	25	73	231	344	149	14	0	0	0	0	0	0	860
19:00	14	2	10	60	177	197	78	8	0	0	0	0	0	0	546
20:00	14	2	16	46	118	185	76	12	1	0	0	0	0	0	470
21:00	8	3	8	30	72	113	47	11	0	0	0	0	0	0	292
22:00	3	1	5	15	58	79	43	6	3	0	0	0	0	0	213
23:00	2	0	1	11	27	49	20	5	0	0	1	0	0	0	116
Total	682	76	352	1360	4010	5521	2339	364	44	1	1	0	0	0	14750

Daily

15th Percentile : 29 MPH
 50th Percentile : 35 MPH
 85th Percentile : 41 MPH
 95th Percentile : 44 MPH

Mean Speed(Average) : 35 MPH

10 MPH Pace Speed : 31-40 MPH

Number in Pace : 9531

Percent in Pace : 64.6%

Number of Vehicles > 35 MPH : 8270

Percent of Vehicles > 35 MPH : 56.1%

Accurate Counts

Location : Macy Street (Route 110)
 Location : West of McDonalds
 City/State: Amesbury, MA

16040SP1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/30/16	6	0	4	4	16	14	5	0	1	1	0	0	0	0	51
01:00	1	0	1	5	13	7	11	2	2	0	1	0	0	0	43
02:00	2	1	1	4	13	16	7	2	0	0	0	0	0	0	46
03:00	3	3	1	6	7	18	12	0	0	0	0	0	0	0	50
04:00	3	0	1	8	15	42	27	4	1	0	0	0	0	0	101
05:00	16	4	5	32	78	171	148	41	3	0	0	0	0	0	498
06:00	46	6	30	69	201	321	149	45	6	0	0	0	0	0	873
07:00	62	7	25	126	369	430	193	21	2	0	0	0	0	0	1235
08:00	94	8	53	198	429	422	125	27	0	1	0	0	0	0	1357
09:00	55	7	23	96	299	381	141	18	1	0	0	0	0	0	1021
10:00	58	6	32	128	320	348	127	11	3	0	0	0	0	0	1033
11:00	59	1	25	160	399	381	113	14	1	0	0	0	0	0	1153
12 PM	51	3	29	137	334	375	119	12	2	0	0	0	0	0	1062
13:00	46	11	41	138	352	413	97	19	2	0	0	0	0	0	1119
14:00	57	1	25	80	301	407	182	23	2	0	0	0	0	0	1078
15:00	54	7	28	92	270	360	160	31	2	0	0	0	0	0	1004
16:00	39	10	25	92	234	417	181	25	3	0	0	0	0	0	1026
17:00	31	3	19	74	258	405	176	27	2	1	0	0	0	0	996
18:00	21	4	14	61	225	351	124	14	4	0	0	0	0	0	818
19:00	17	4	18	76	172	232	71	7	1	0	0	0	0	0	598
20:00	10	3	14	36	103	155	59	8	0	0	0	0	0	0	388
21:00	7	1	21	41	137	171	55	6	1	0	0	0	0	0	440
22:00	8	0	12	22	77	98	44	3	3	0	0	0	0	0	267
23:00	4	1	3	9	38	60	29	4	1	0	0	0	0	0	149
Total	750	91	450	1694	4660	5995	2355	364	43	3	1	0	0	0	16406

Daily

15th Percentile : 28 MPH
 50th Percentile : 35 MPH
 85th Percentile : 40 MPH
 95th Percentile : 44 MPH

Mean Speed(Average) : 35 MPH
 10 MPH Pace Speed : 31-40 MPH
 Number in Pace : 10655
 Percent in Pace : 64.9%
 Number of Vehicles > 35 MPH : 8761
 Percent of Vehicles > 35 MPH : 53.4%

Accurate Counts

Location : Macy Street (Route 110)
 Location : West of McDonalds
 City/State: Amesbury, MA

16040SP1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
10/01/16	2	0	1	5	20	26	17	3	1	0	0	0	0	0	75
01:00	5	1	2	14	17	20	6	1	0	1	0	0	0	0	67
02:00	3	0	1	9	13	10	6	1	0	0	0	0	0	0	43
03:00	6	1	2	6	9	6	2	1	0	0	0	0	0	0	33
04:00	14	1	4	13	8	3	9	2	0	0	0	0	0	0	54
05:00	73	1	17	28	9	21	10	3	0	0	0	0	0	0	162
06:00	143	1	28	37	23	33	25	5	3	0	0	0	0	0	298
07:00	152	15	20	47	65	104	51	16	2	0	0	0	0	0	472
08:00	31	33	32	79	166	208	101	18	2	0	0	0	0	0	670
09:00	40	20	45	119	193	210	69	12	0	0	0	0	0	0	708
10:00	74	15	37	84	194	246	112	15	0	0	0	0	0	0	777
11:00	86	11	29	86	223	284	128	16	0	0	0	0	0	0	863
12 PM	87	12	30	88	227	288	131	17	0	0	0	0	0	0	880
13:00	85	10	25	85	219	278	127	16	0	0	0	0	0	0	845
14:00	80	10	27	80	206	260	117	16	0	0	0	0	0	0	796
15:00	73	11	24	73	191	243	111	15	0	0	0	0	0	0	741
16:00	71	13	21	72	184	234	106	14	0	0	0	0	0	0	715
17:00	64	8	19	64	165	210	96	12	0	0	0	0	0	0	638
18:00	58	5	19	58	151	192	87	12	0	0	0	0	0	0	582
19:00	42	5	12	42	110	141	65	8	0	0	0	0	0	0	425
20:00	33	5	10	33	83	105	48	7	0	0	0	0	0	0	324
21:00	24	5	8	24	64	80	36	4	0	0	0	0	0	0	245
22:00	25	3	7	25	64	80	36	4	0	0	0	0	0	0	244
23:00	15	1	5	15	41	52	24	4	0	0	0	0	0	0	157
Total	1286	187	425	1186	2645	3334	1520	222	8	1	0	0	0	0	10814

Daily

15th Percentile : 21 MPH
 50th Percentile : 34 MPH
 85th Percentile : 40 MPH
 95th Percentile : 43 MPH

Mean Speed(Average) : 32 MPH
 10 MPH Pace Speed : 31-40 MPH
 Number in Pace : 5979
 Percent in Pace : 55.3%
 Number of Vehicles > 35 MPH : 5085
 Percent of Vehicles > 35 MPH : 47.0%

Grand Total	2718	354	1227	4240	11315	14850	6214	950	95	5	2	0	0	0	41970
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Overall

15th Percentile : 27 MPH
 50th Percentile : 35 MPH
 85th Percentile : 40 MPH
 95th Percentile : 44 MPH

Mean Speed(Average) : 34 MPH
 10 MPH Pace Speed : 31-40 MPH
 Number in Pace : 26165
 Percent in Pace : 62.3%
 Number of Vehicles > 35 MPH : 22116
 Percent of Vehicles > 35 MPH : 52.7%

Accurate Counts

Location : Macy Street (Route 110)

978-664-2565

Location : West of McDonalds

City/State: Amesbury, MA

16040SP1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/29/16	8	0	0	4	11	23	10	1	0	1	0	0	0	0	58
01:00	5	1	0	0	9	11	5	2	2	0	0	0	0	0	35
02:00	5	0	0	3	9	12	5	0	0	0	0	0	0	0	34
03:00	5	0	2	5	5	8	4	1	0	0	0	0	0	0	30
04:00	12	1	5	3	16	20	15	3	1	0	0	0	0	0	76
05:00	11	1	2	7	36	52	29	6	2	0	0	0	0	0	146
06:00	65	6	16	35	114	146	103	32	6	0	0	0	0	0	523
07:00	124	2	24	71	155	220	155	42	4	1	0	0	0	0	798
08:00	126	5	21	76	210	237	140	23	3	2	0	0	0	0	843
09:00	113	8	24	56	175	226	124	14	4	0	0	0	0	0	744
10:00	109	5	32	57	150	190	102	35	7	1	0	0	0	0	688
11:00	82	8	14	46	152	242	102	23	4	0	0	0	0	0	673
12 PM	120	4	28	66	229	259	104	17	0	0	0	0	0	0	827
13:00	130	7	22	67	226	208	105	17	2	1	1	0	0	0	786
14:00	122	14	52	74	241	305	109	12	0	0	0	0	0	0	929
15:00	119	9	48	135	267	351	129	19	3	1	0	0	0	0	1081
16:00	133	15	36	114	318	328	174	25	5	0	0	0	0	0	1148
17:00	123	2	43	156	356	414	144	27	3	1	0	0	0	0	1269
18:00	108	5	21	114	307	266	112	12	4	0	0	0	0	0	949
19:00	59	10	17	36	156	245	98	17	1	0	0	0	0	0	639
20:00	50	2	6	36	84	157	111	13	2	0	0	0	0	0	461
21:00	41	1	3	9	66	140	82	12	1	0	0	0	0	0	355
22:00	29	2	3	5	34	75	79	14	3	0	0	0	0	0	244
23:00	22	0	2	10	21	72	50	11	1	1	0	0	0	0	190
Total	1721	108	421	1185	3347	4207	2091	378	58	9	1	0	0	0	13526

Daily

15th Percentile : 22 MPH
 50th Percentile : 34 MPH
 85th Percentile : 41 MPH
 95th Percentile : 44 MPH

Mean Speed(Average) : 33 MPH

10 MPH Pace Speed : 31-40 MPH

Number in Pace : 7554

Percent in Pace : 55.8%

Number of Vehicles > 35 MPH : 6744

Percent of Vehicles > 35 MPH : 49.9%

Accurate Counts

Location : Macy Street (Route 110)
 Location : West of McDonalds
 City/State: Amesbury, MA

16040SP1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/30/16	17	1	2	1	10	37	44	2	1	0	0	0	0	0	115
01:00	7	0	1	3	2	20	20	3	0	0	0	0	0	0	56
02:00	7	1	0	1	6	15	8	0	1	1	0	0	0	0	40
03:00	6	1	2	3	6	7	14	10	2	0	0	0	0	0	51
04:00	14	0	2	2	10	30	15	7	0	0	0	0	0	0	80
05:00	35	1	2	12	45	47	55	12	3	0	0	0	0	0	212
06:00	101	2	7	30	107	145	85	26	2	0	0	0	0	0	505
07:00	145	1	32	93	182	219	108	16	0	0	0	0	0	0	796
08:00	123	3	26	92	178	213	87	17	2	0	0	0	0	0	741
09:00	114	3	30	69	169	174	113	8	1	0	0	0	0	0	681
10:00	106	3	21	110	218	184	75	9	1	0	0	0	0	0	727
11:00	80	8	20	72	187	224	89	8	3	0	0	0	0	0	691
12 PM	143	7	20	62	187	210	108	18	0	0	0	0	0	0	755
13:00	121	3	26	102	229	218	101	21	4	0	0	0	0	0	825
14:00	122	11	27	88	218	291	115	24	3	1	0	0	0	0	900
15:00	151	25	38	125	282	333	143	19	2	1	0	0	0	0	1119
16:00	135	11	28	119	323	337	145	17	1	1	0	0	0	0	1117
17:00	132	11	27	143	335	324	124	26	4	0	0	0	0	0	1126
18:00	110	3	24	94	259	305	123	20	0	0	0	0	0	0	938
19:00	78	11	16	60	200	205	81	10	0	0	0	0	0	0	661
20:00	42	2	4	14	91	185	76	20	2	0	0	0	0	0	436
21:00	67	3	12	16	106	137	89	8	2	0	0	0	0	0	440
22:00	43	0	2	7	43	110	71	15	1	0	0	0	0	0	292
23:00	21	0	1	9	40	100	92	25	2	0	0	0	0	0	290
Total	1920	111	370	1327	3433	4070	1981	341	37	4	0	0	0	0	13594

Daily

15th Percentile : 20 MPH
 50th Percentile : 34 MPH
 85th Percentile : 40 MPH
 95th Percentile : 44 MPH

Mean Speed(Average) : 32 MPH
 10 MPH Pace Speed : 31-40 MPH
 Number in Pace : 7503
 Percent in Pace : 55.2%
 Number of Vehicles > 35 MPH : 6433
 Percent of Vehicles > 35 MPH : 47.3%

Accurate Counts

Location : Macy Street (Route 110)

978-664-2565

Location : West of McDonalds

City/State: Amesbury, MA

16040SP1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
10/01/16	6	0	0	4	12	41	53	13	5	0	0	0	0	0	134
01:00	12	1	1	5	13	39	13	9	1	0	0	0	0	0	94
02:00	9	0	0	1	5	14	10	2	2	0	0	0	0	0	43
03:00	3	1	1	6	8	8	5	5	0	1	0	0	0	0	38
04:00	2	2	1	2	6	7	3	3	0	0	0	0	0	0	26
05:00	20	1	3	5	18	23	22	4	1	0	0	1	0	0	98
06:00	36	0	4	9	25	58	43	8	0	0	0	0	0	0	183
07:00	54	3	5	16	45	92	75	27	7	0	0	0	0	0	324
08:00	87	2	13	24	121	134	73	16	3	0	0	0	0	0	473
09:00	87	5	23	81	151	164	66	12	0	0	0	0	0	0	589
10:00	86	1	19	58	182	170	52	6	0	1	0	0	0	0	575
11:00	90	4	29	74	176	158	39	6	3	0	0	0	0	0	579
12 PM	85	9	23	66	191	165	41	8	1	0	0	0	0	0	589
13:00	68	5	29	74	180	151	49	4	1	0	0	0	0	0	561
14:00	83	6	19	75	184	160	50	5	0	0	0	0	0	0	582
15:00	87	2	21	42	202	160	71	14	0	0	0	0	0	0	599
16:00	80	4	14	61	164	167	80	10	0	0	0	0	0	0	580
17:00	62	3	6	72	181	178	69	12	1	0	0	0	0	0	584
18:00	61	2	18	52	143	150	44	13	1	0	0	0	0	0	484
19:00	39	4	20	23	127	143	43	6	1	0	0	0	0	0	406
20:00	31	2	15	20	112	142	52	6	0	0	0	0	0	0	380
21:00	29	1	6	25	104	147	40	1	0	0	0	0	0	0	353
22:00	23	0	2	16	76	114	48	3	3	0	0	0	0	0	285
23:00	22	0	0	3	41	87	39	3	1	0	0	0	0	0	196
Total	1162	58	272	814	2467	2672	1080	196	31	2	0	1	0	0	8755

Daily

15th Percentile : 21 MPH
 50th Percentile : 34 MPH
 85th Percentile : 39 MPH
 95th Percentile : 44 MPH

Mean Speed(Average) : 32 MPH

10 MPH Pace Speed : 31-40 MPH

Number in Pace : 5139

Percent in Pace : 58.7%

Number of Vehicles > 35 MPH : 3982

Percent of Vehicles > 35 MPH : 45.5%

Grand Total

4803 277 1063 3326 9247 10949 5152 915 126 15 1 1 0 0 35875

Overall

15th Percentile : 21 MPH
 50th Percentile : 34 MPH
 85th Percentile : 40 MPH
 95th Percentile : 44 MPH

Mean Speed(Average) : 32 MPH

10 MPH Pace Speed : 31-40 MPH

Number in Pace : 20196

Percent in Pace : 56.3%

Number of Vehicles > 35 MPH : 17159

Percent of Vehicles > 35 MPH : 47.8%

Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 16040001
 Site Code : 16040001
 Start Date : 9/29/2016
 Page No : 1

Groups Printed- Cars - Trucks - Outs at In Dwy

Start Time	McDonalds Dwy From North		Macy St From East		Macy St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	5	24	0	13	18	0	60
07:15 AM	6	41	0	12	30	0	89
07:30 AM	9	28	0	12	40	0	89
07:45 AM	7	27	0	8	28	0	70
Total	27	120	0	45	116	0	308
08:00 AM	11	33	0	13	30	0	87
08:15 AM	11	35	0	15	27	0	88
08:30 AM	1	33	0	11	20	0	65
08:45 AM	6	22	0	17	9	0	54
Total	29	123	0	56	86	0	294
Grand Total	56	243	0	101	202	0	602
Apprch %	18.7	81.3	0	100	100	0	
Total %	9.3	40.4	0	16.8	33.6	0	
Cars	56	226	0	100	193	0	575
% Cars	100	93	0	99	95.5	0	95.5
Trucks	0	8	0	1	9	0	18
% Trucks	0	3.3	0	1	4.5	0	3
Outs at In Dwy	0	9	0	0	0	0	9
% Outs at In Dwy	0	3.7	0	0	0	0	1.5

Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

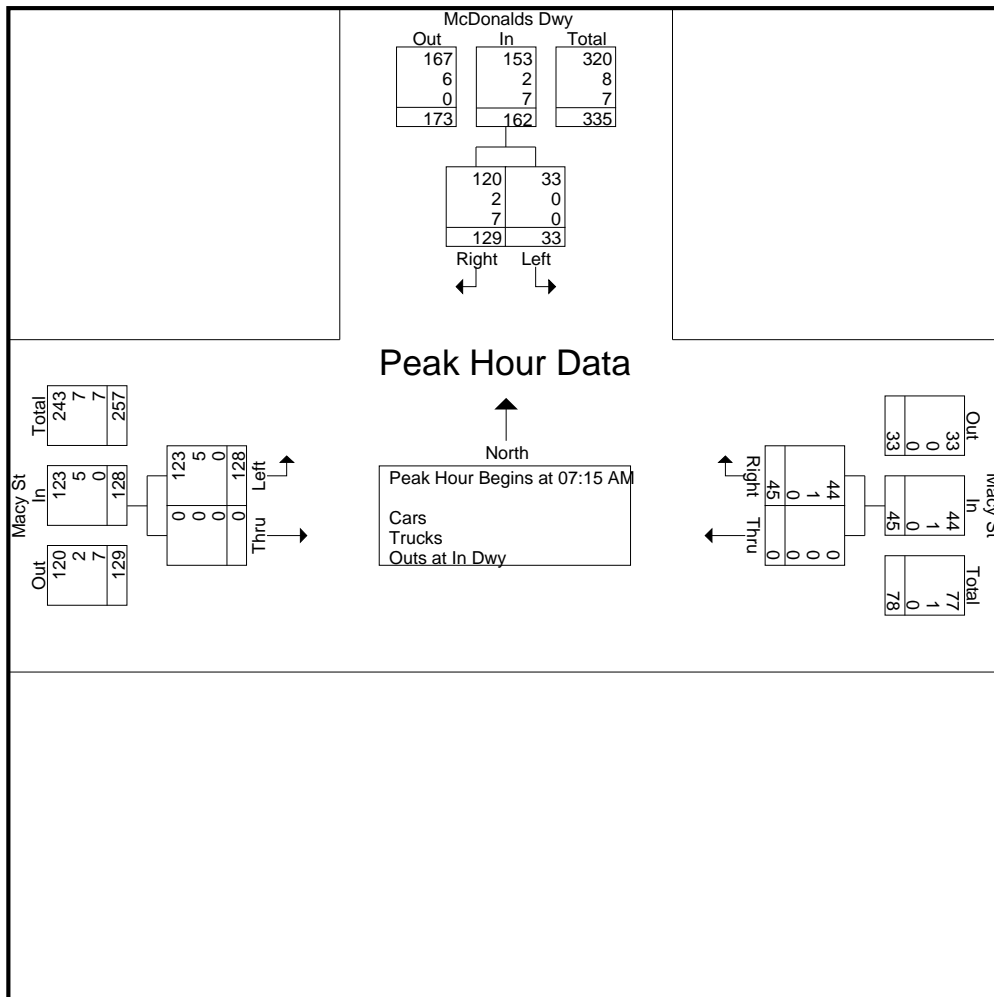
File Name : 16040001
 Site Code : 16040001
 Start Date : 9/29/2016
 Page No : 2

	McDonalds Dwy From North			Macy St From East			Macy St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:15 AM

07:15 AM	6	41	47	0	12	12	30	0	30	89
07:30 AM	9	28	37	0	12	12	40	0	40	89
07:45 AM	7	27	34	0	8	8	28	0	28	70
08:00 AM	11	33	44	0	13	13	30	0	30	87
Total Volume	33	129	162	0	45	45	128	0	128	335
% App. Total	20.4	79.6		0	100		100	0		
PHF	.750	.787	.862	.000	.865	.865	.800	.000	.800	.941
Cars	33	120	153	0	44	44	123	0	123	320
% Cars	100	93.0	94.4	0	97.8	97.8	96.1	0	96.1	95.5
Trucks	0	2	2	0	1	1	5	0	5	8
% Trucks	0	1.6	1.2	0	2.2	2.2	3.9	0	3.9	2.4
Outs at In Dwy	0	7	7	0	0	0	0	0	0	7
% Outs at In Dwy	0	5.4	4.3	0	0	0	0	0	0	2.1



Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 16040001
 Site Code : 16040001
 Start Date : 9/29/2016
 Page No : 1

Groups Printed- Outs at In Dwy							
	McDonalds Dwy From North		Macy St From East		Macy St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
07:00 AM	0	1	0	0	0	0	1
07:15 AM	0	3	0	0	0	0	3
07:30 AM	0	2	0	0	0	0	2
07:45 AM	0	1	0	0	0	0	1
Total	0	7	0	0	0	0	7
08:00 AM	0	1	0	0	0	0	1
08:15 AM	0	1	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	2
Grand Total	0	9	0	0	0	0	9
Apprch %	0	100	0	0	0	0	
Total %	0	100	0	0	0	0	

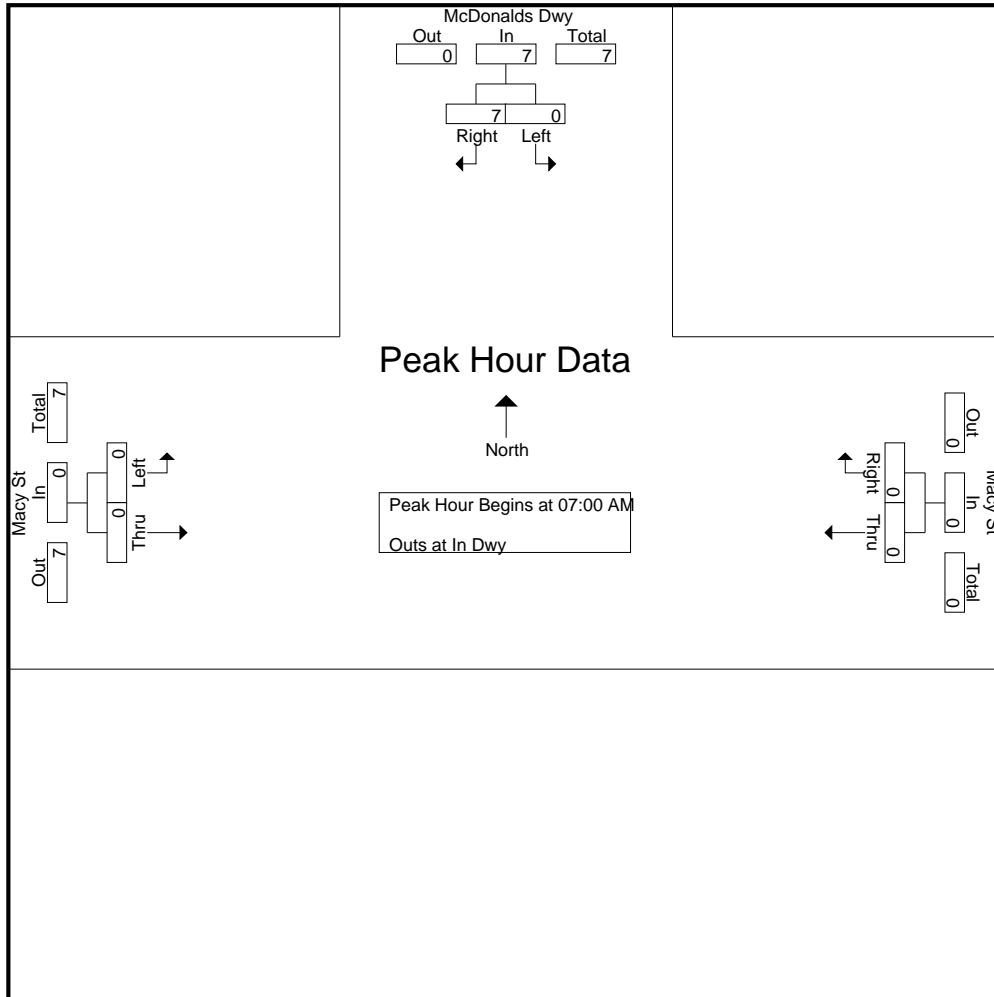
Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 16040001
 Site Code : 16040001
 Start Date : 9/29/2016
 Page No : 2

	McDonalds Dwy From North			Macy St From East			Macy St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	1	1	0	0	0	0	0	0	1
07:15 AM	0	3	3	0	0	0	0	0	0	3
07:30 AM	0	2	2	0	0	0	0	0	0	2
07:45 AM	0	1	1	0	0	0	0	0	0	1
Total Volume	0	7	7	0	0	0	0	0	0	7
% App. Total	0	100		0	0		0	0		
PHF	.000	.583	.583	.000	.000	.000	.000	.000	.000	.583



Accurate Counts

978-664-2565

N/S Street : McDonalds Back
 E/W Street : Cut Thru
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 16040002
 Site Code : 16040002
 Start Date : 9/29/2016
 Page No : 1

Groups Printed- Cars - Trucks

	Cut Thru From East	Cut Thru From West	
Start Time	Thru	Thru	Int. Total
07:00 AM	7	2	9
07:15 AM	5	6	11
07:30 AM	5	9	14
07:45 AM	4	5	9
Total	21	22	43
08:00 AM	8	6	14
08:15 AM	7	6	13
08:30 AM	7	7	14
08:45 AM	4	1	5
Total	26	20	46
Grand Total	47	42	89
Apprch %	100	100	
Total %	52.8	47.2	
Cars	45	36	81
% Cars	95.7	85.7	91
Trucks	2	6	8
% Trucks	4.3	14.3	9

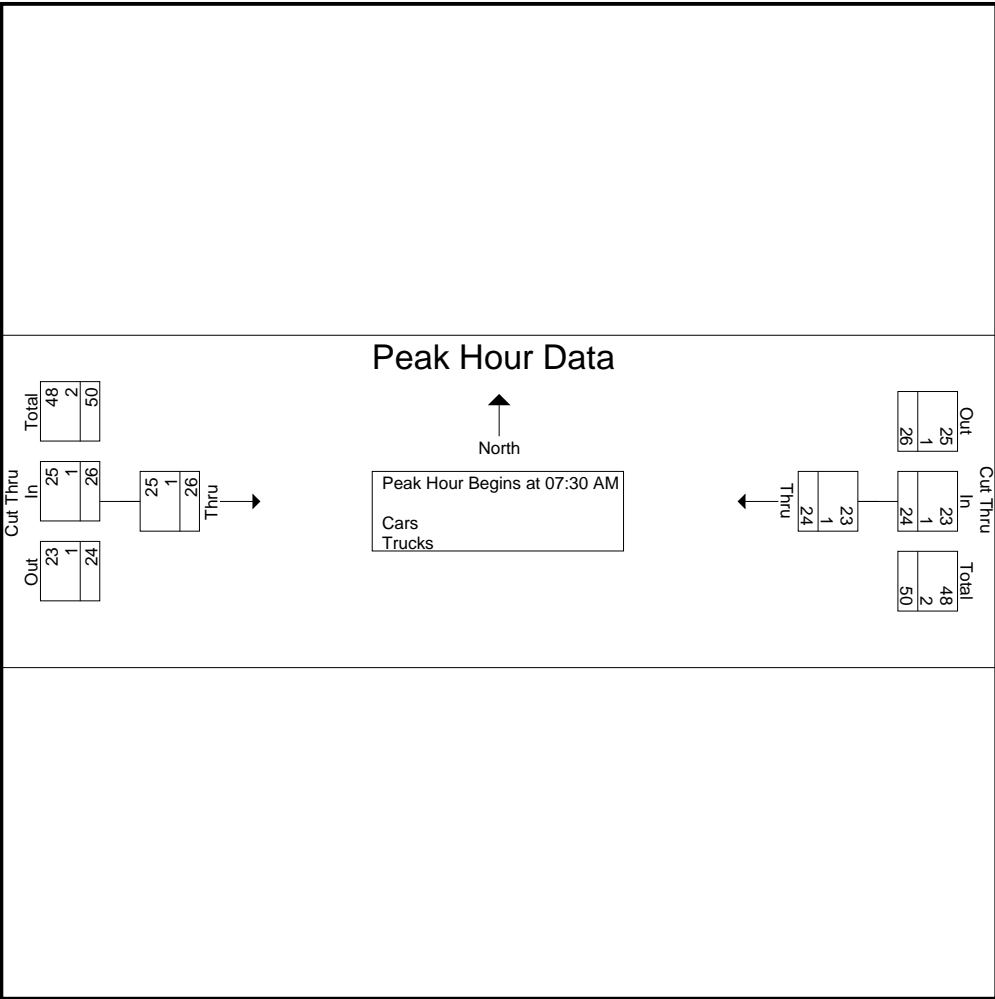
Accurate Counts

978-664-2565

N/S Street : McDonalds Back
 E/W Street : Cut Thru
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 16040002
 Site Code : 16040002
 Start Date : 9/29/2016
 Page No : 2

	Cut Thru From East		Cut Thru From West		
Start Time	Thru	App. Total	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 07:30 AM					
07:30 AM	5	5	9	9	14
07:45 AM	4	4	5	5	9
08:00 AM	8	8	6	6	14
08:15 AM	7	7	6	6	13
Total Volume	24	24	26	26	50
% App. Total	100		100		
PHF	.750	.750	.722	.722	.893
Cars	23	23	25	25	48
% Cars	95.8	95.8	96.2	96.2	96.0
Trucks	1	1	1	1	2
% Trucks	4.2	4.2	3.8	3.8	4.0



Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 16040001
 Site Code : 16040001
 Start Date : 9/29/2016
 Page No : 1

Groups Printed- Cars - Trucks - Outs at In Dwy

Start Time	McDonalds Dwy From North		Macy St From East		Macy St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	2	30	0	16	20	0	68
04:15 PM	4	26	0	10	25	0	65
04:30 PM	1	15	0	2	15	0	33
04:45 PM	3	23	0	9	18	0	53
Total	10	94	0	37	78	0	219
05:00 PM	4	32	0	17	18	0	71
05:15 PM	6	20	0	9	12	0	47
05:30 PM	2	22	0	6	16	1	47
05:45 PM	4	16	0	10	16	0	46
Total	16	90	0	42	62	1	211
Grand Total	26	184	0	79	140	1	430
Apprch %	12.4	87.6	0	100	99.3	0.7	
Total %	6	42.8	0	18.4	32.6	0.2	
Cars	24	177	0	79	140	1	421
% Cars	92.3	96.2	0	100	100	100	97.9
Trucks	1	1	0	0	0	0	2
% Trucks	3.8	0.5	0	0	0	0	0.5
Outs at In Dwy	1	6	0	0	0	0	7
% Outs at In Dwy	3.8	3.3	0	0	0	0	1.6

Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

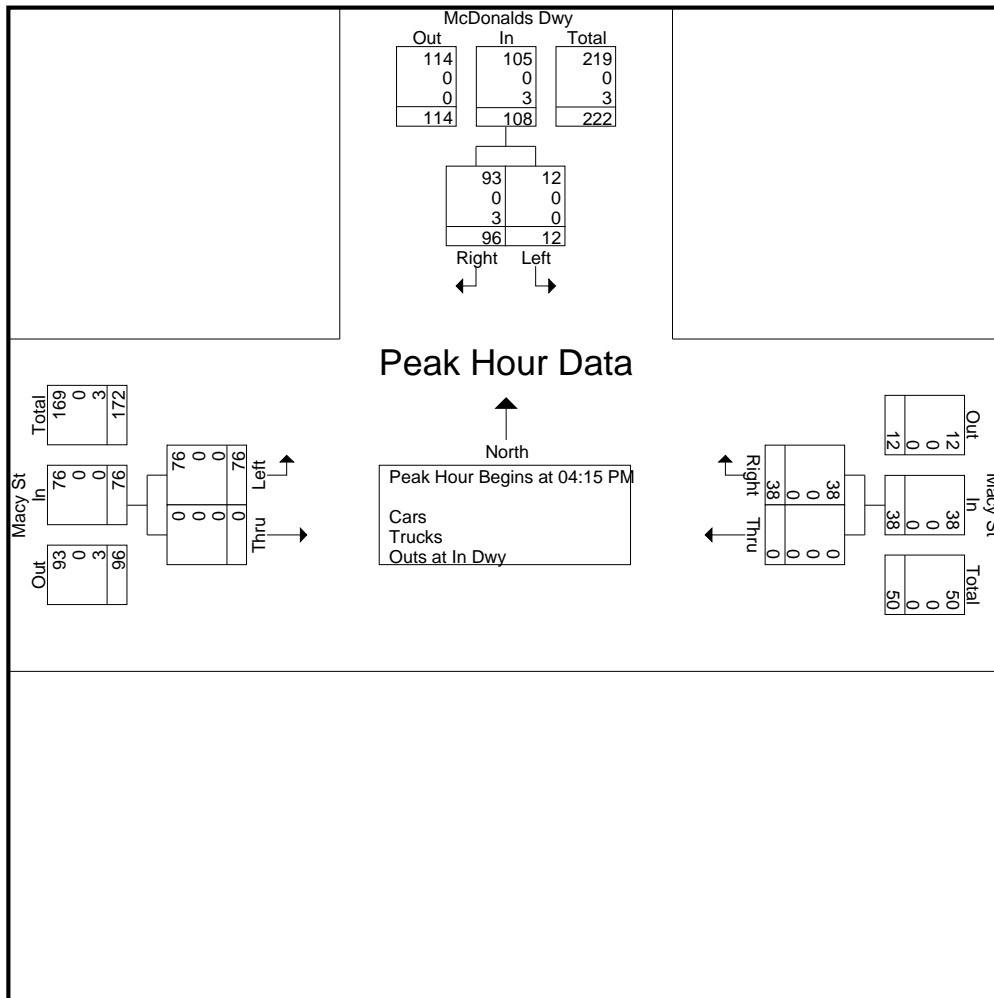
File Name : 16040001
 Site Code : 16040001
 Start Date : 9/29/2016
 Page No : 2

	McDonalds Dwy From North			Macy St From East			Macy St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM

04:15 PM	4	26	30	0	10	10	25	0	25	65
04:30 PM	1	15	16	0	2	2	15	0	15	33
04:45 PM	3	23	26	0	9	9	18	0	18	53
05:00 PM	4	32	36	0	17	17	18	0	18	71
Total Volume	12	96	108	0	38	38	76	0	76	222
% App. Total	11.1	88.9		0	100		100	0		
PHF	.750	.750	.750	.000	.559	.559	.760	.000	.760	.782
Cars	12	93	105	0	38	38	76	0	76	219
% Cars	100	96.9	97.2	0	100	100	100	0	100	98.6
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0
Outs at In Dwy	0	3	3	0	0	0	0	0	0	3
% Outs at In Dwy	0	3.1	2.8	0	0	0	0	0	0	1.4



Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 16040001
 Site Code : 16040001
 Start Date : 9/29/2016
 Page No : 1

Groups Printed- Outs at In Dwy							
	McDonalds Dwy From North		Macy St From East		Macy St From West		
Start Time	Left	Right	Thru	Right	Left	Thru	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	1	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	1	0	0	0	0	1
Total	0	2	0	0	0	0	2
05:00 PM	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	2	0	0	0	0	2
05:45 PM	1	1	0	0	0	0	2
Total	1	4	0	0	0	0	5
Grand Total	1	6	0	0	0	0	7
Apprch %	14.3	85.7	0	0	0	0	
Total %	14.3	85.7	0	0	0	0	

Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

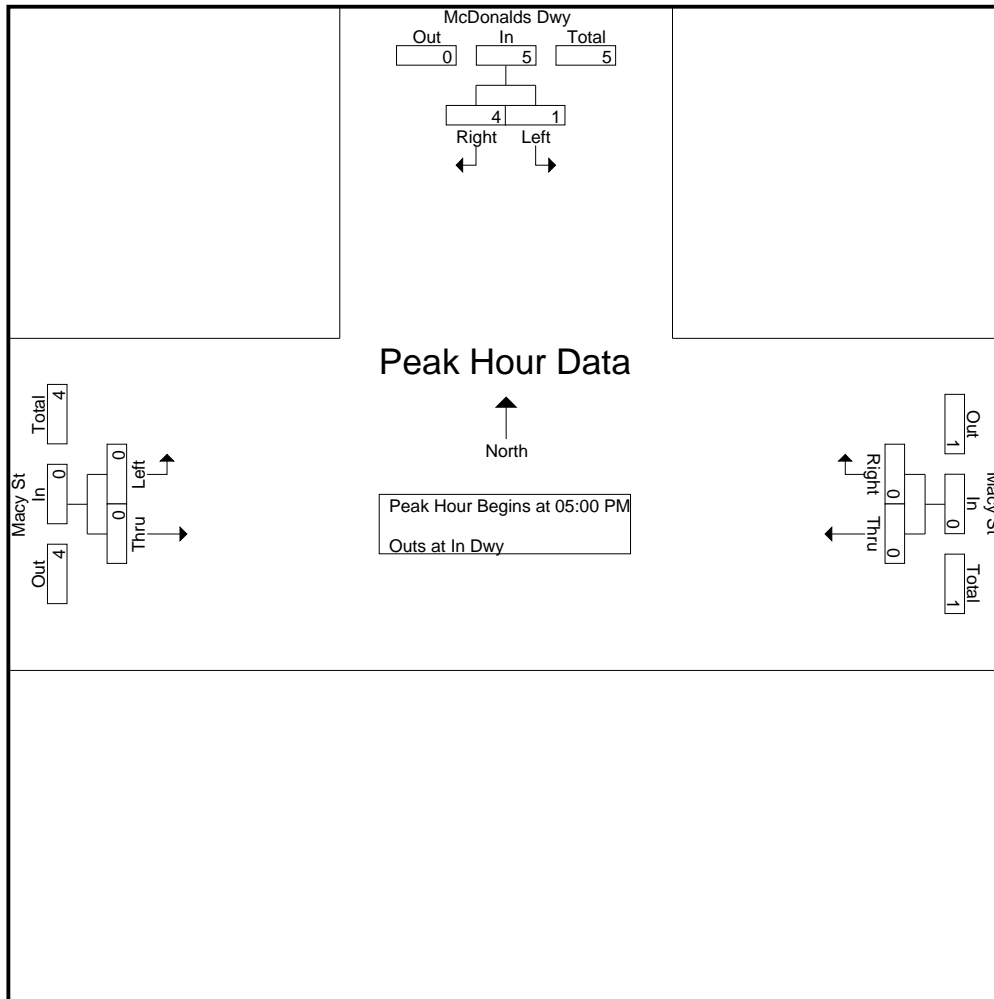
File Name : 16040001
 Site Code : 16040001
 Start Date : 9/29/2016
 Page No : 2

	McDonalds Dwy From North			Macy St From East			Macy St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

05:00 PM	0	1	1	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	2	2	0	0	0	0	0	0	2
05:45 PM	1	1	2	0	0	0	0	0	0	2
Total Volume	1	4	5	0	0	0	0	0	0	5
% App. Total	20	80		0	0		0	0		
PHF	.250	.500	.625	.000	.000	.000	.000	.000	.000	.625



Accurate Counts

978-664-2565

N/S Street : McDonalds Back
 E/W Street : Cut Thru
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 16040002
 Site Code : 16040002
 Start Date : 9/29/2016
 Page No : 1

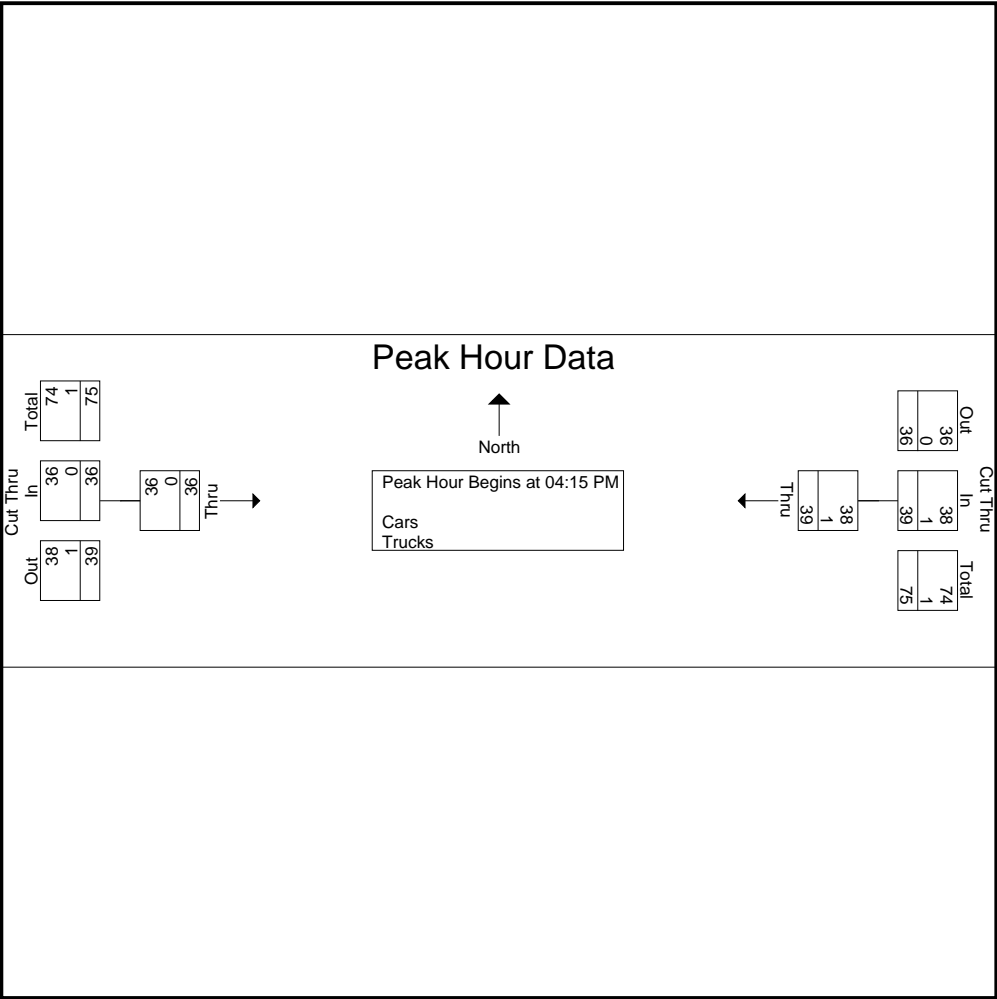
Groups Printed- Cars - Trucks				
	Cut Thru From East	Cut Thru From West		
Start Time	Thru	Thru		Int. Total
04:00 PM	2	8		10
04:15 PM	4	8		12
04:30 PM	7	10		17
04:45 PM	8	12		20
Total	21	38		59
05:00 PM	20	6		26
05:15 PM	4	7		11
05:30 PM	6	7		13
05:45 PM	8	10		18
Total	38	30		68
Grand Total	59	68		127
Apprch %	100	100		
Total %	46.5	53.5		
Cars	58	68		126
% Cars	98.3	100		99.2
Trucks	1	0		1
% Trucks	1.7	0		0.8

Accurate Counts
978-664-2565

N/S Street : McDonalds Back
E/W Street : Cut Thru
City/State : Amesbury, MA
Weather : Cloudy

File Name : 16040002
Site Code : 16040002
Start Date : 9/29/2016
Page No : 2

	Cut Thru From East		Cut Thru From West		
Start Time	Thru	App. Total	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 04:15 PM					
04:15 PM	4	4	8	8	12
04:30 PM	7	7	10	10	17
04:45 PM	8	8	12	12	20
05:00 PM	20	20	6	6	26
Total Volume	39	39	36	36	75
% App. Total	100		100		
PHF	.488	.488	.750	.750	.721
Cars	38	38	36	36	74
% Cars	97.4	97.4	100	100	98.7
Trucks	1	1	0	0	1
% Trucks	2.6	2.6	0	0	1.3



Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 160400S1
 Site Code : 16040001
 Start Date : 10/1/2016
 Page No : 1

Groups Printed- Cars - Trucks - Outs at In Dwy

Start Time	McDonalds Dwy From North		Macy St From East		Macy St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
11:00 AM	7	29	0	7	24	0	67
11:15 AM	1	26	0	11	20	0	58
11:30 AM	6	29	0	11	28	0	74
11:45 AM	1	24	0	9	23	0	57
Total	15	108	0	38	95	0	256
12:00 PM	10	19	0	8	24	0	61
12:15 PM	8	26	0	12	17	0	63
12:30 PM	6	28	0	15	11	0	60
12:45 PM	12	27	0	12	11	0	62
Total	36	100	0	47	63	0	246
01:00 PM	2	26	0	14	22	0	64
01:15 PM	6	22	0	8	18	0	54
01:30 PM	7	21	0	13	18	0	59
01:45 PM	6	21	0	14	18	0	59
Total	21	90	0	49	76	0	236
Grand Total	72	298	0	134	234	0	738
Apprch %	19.5	80.5	0	100	100	0	
Total %	9.8	40.4	0	18.2	31.7	0	
Cars	65	286	0	134	233	0	718
% Cars	90.3	96	0	100	99.6	0	97.3
Trucks	0	1	0	0	1	0	2
% Trucks	0	0.3	0	0	0.4	0	0.3
Outs at In Dwy	7	11	0	0	0	0	18
% Outs at In Dwy	9.7	3.7	0	0	0	0	2.4

Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

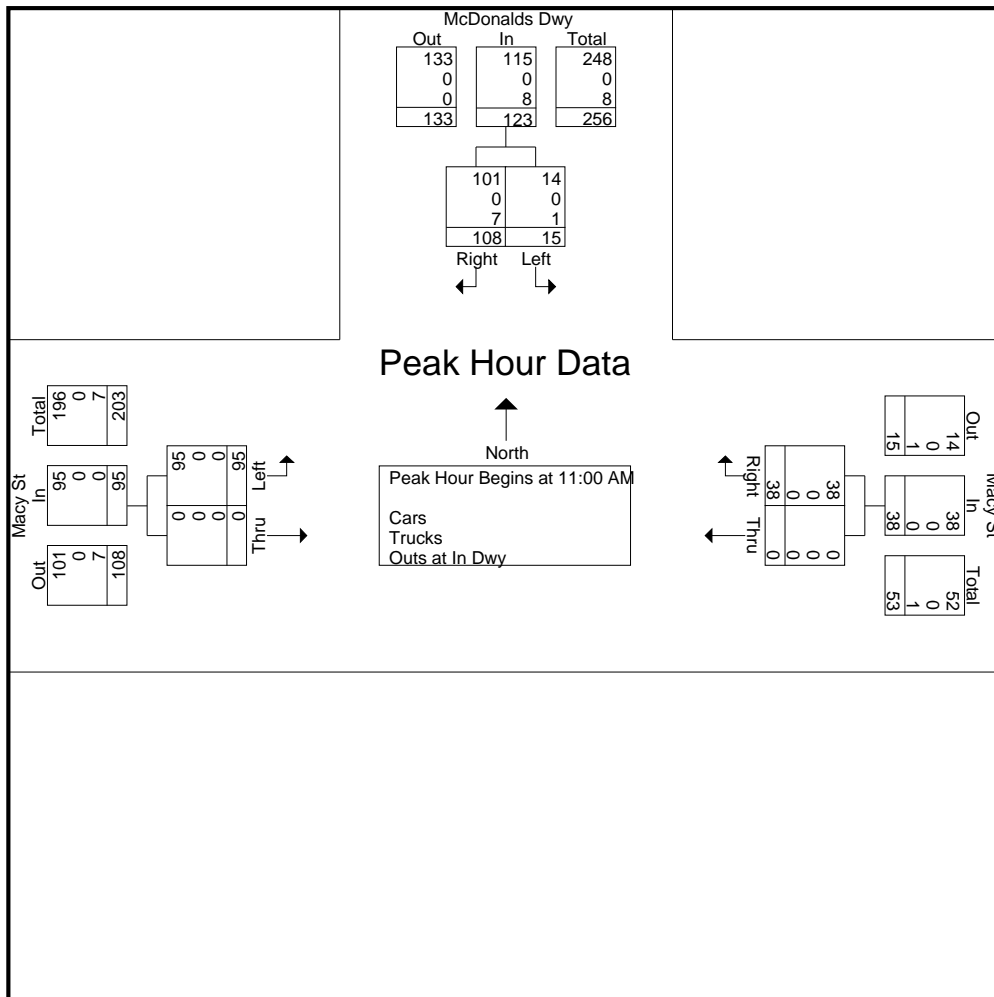
File Name : 160400S1
 Site Code : 16040001
 Start Date : 10/1/2016
 Page No : 2

	McDonalds Dwy From North			Macy St From East			Macy St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM

11:00 AM	7	29	36	0	7	7	24	0	24	67
11:15 AM	1	26	27	0	11	11	20	0	20	58
11:30 AM	6	29	35	0	11	11	28	0	28	74
11:45 AM	1	24	25	0	9	9	23	0	23	57
Total Volume	15	108	123	0	38	38	95	0	95	256
% App. Total	12.2	87.8		0	100		100	0		
PHF	.536	.931	.854	.000	.864	.864	.848	.000	.848	.865
Cars	14	101	115	0	38	38	95	0	95	248
% Cars	93.3	93.5	93.5	0	100	100	100	0	100	96.9
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0
Outs at In Dwy	1	7	8	0	0	0	0	0	0	8
% Outs at In Dwy	6.7	6.5	6.5	0	0	0	0	0	0	3.1



Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 160400S1
 Site Code : 16040001
 Start Date : 10/1/2016
 Page No : 1

Groups Printed- Outs at In Dwy

Start Time	McDonalds Dwy From North		Macy St From East		Macy St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
11:00 AM	0	1	0	0	0	0	1
11:15 AM	0	1	0	0	0	0	1
11:30 AM	1	3	0	0	0	0	4
11:45 AM	0	2	0	0	0	0	2
Total	1	7	0	0	0	0	8
12:00 PM	0	0	0	0	0	0	0
12:15 PM	1	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0
12:45 PM	0	1	0	0	0	0	1
Total	1	1	0	0	0	0	2
01:00 PM	0	0	0	0	0	0	0
01:15 PM	1	3	0	0	0	0	4
01:30 PM	3	0	0	0	0	0	3
01:45 PM	1	0	0	0	0	0	1
Total	5	3	0	0	0	0	8
Grand Total	7	11	0	0	0	0	18
Apprch %	38.9	61.1	0	0	0	0	
Total %	38.9	61.1	0	0	0	0	

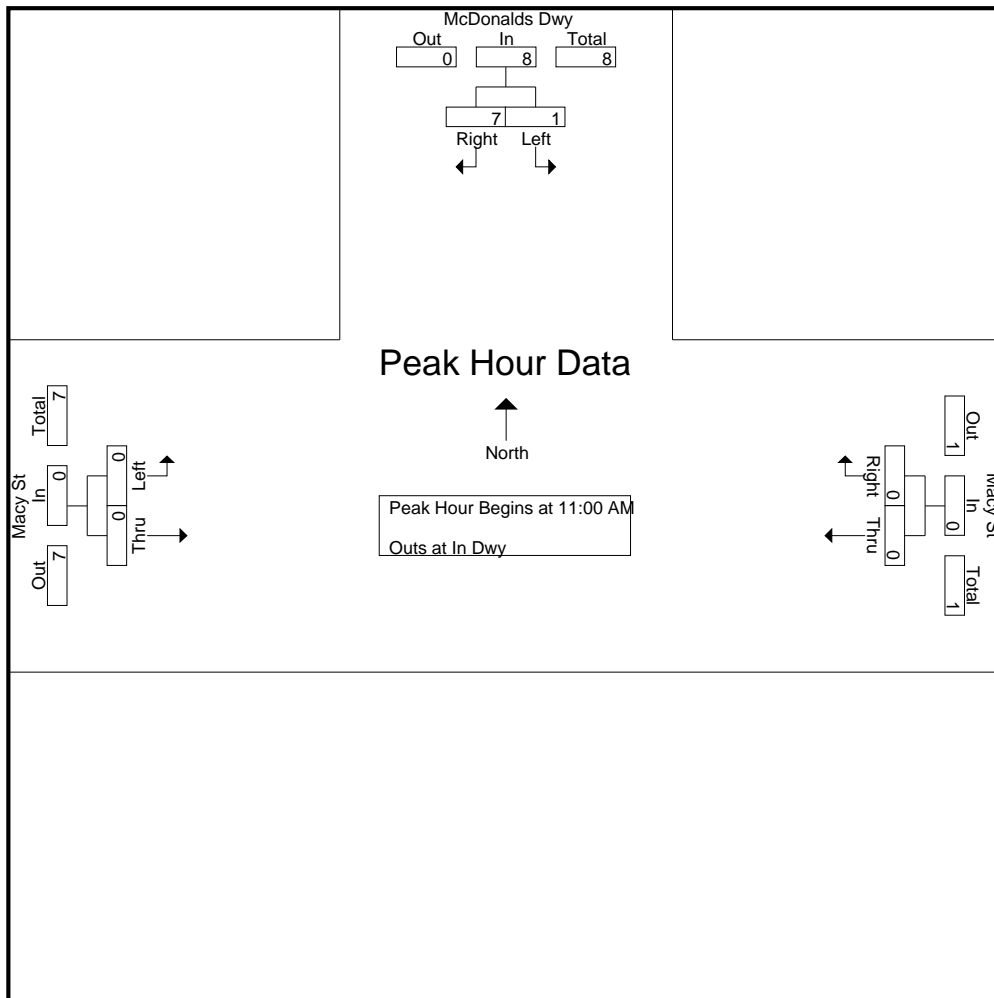
Accurate Counts

978-664-2565

N/S Street : McDonald's Driveways
 E/W Street : Macy Street (Route 110)
 City/State : Amesbury, MA
 Weather : Cloudy

File Name : 160400S1
 Site Code : 16040001
 Start Date : 10/1/2016
 Page No : 2

	McDonalds Dwy From North			Macy St From East			Macy St From West			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	0	1	1	0	0	0	0	0	0	1
11:15 AM	0	1	1	0	0	0	0	0	0	1
11:30 AM	1	3	4	0	0	0	0	0	0	4
11:45 AM	0	2	2	0	0	0	0	0	0	2
Total Volume	1	7	8	0	0	0	0	0	0	8
% App. Total	12.5	87.5		0	0		0	0		
PHF	.250	.583	.500	.000	.000	.000	.000	.000	.000	.500



Accurate Counts

978-664-2565

N/S Street : McDonalds Back
 E/W Street : Cut Thru
 City/State : Amesbury, MA
 Weather : Clear

File Name : 160400S2
 Site Code : 16040002
 Start Date : 10/8/2016
 Page No : 1

Groups Printed- Cars - Trucks				
	Cut Thru From East	Cut Thru From West		
Start Time	Thru	Thru	Int. Total	
11:00 AM	6	10	16	
11:15 AM	5	9	14	
11:30 AM	6	3	9	
11:45 AM	5	9	14	
Total	22	31	53	
12:00 PM	1	8	9	
12:15 PM	4	9	13	
12:30 PM	9	10	19	
12:45 PM	1	7	8	
Total	15	34	49	
01:00 PM	5	7	12	
01:15 PM	5	4	9	
01:30 PM	8	11	19	
01:45 PM	2	5	7	
Total	20	27	47	
Grand Total	57	92	149	
Apprch %	100	100		
Total %	38.3	61.7		
Cars	55	86	141	
% Cars	96.5	93.5	94.6	
Trucks	2	6	8	
% Trucks	3.5	6.5	5.4	

Accurate Counts

978-664-2565

N/S Street : McDonalds Back
 E/W Street : Cut Thru
 City/State : Amesbury, MA
 Weather : Clear

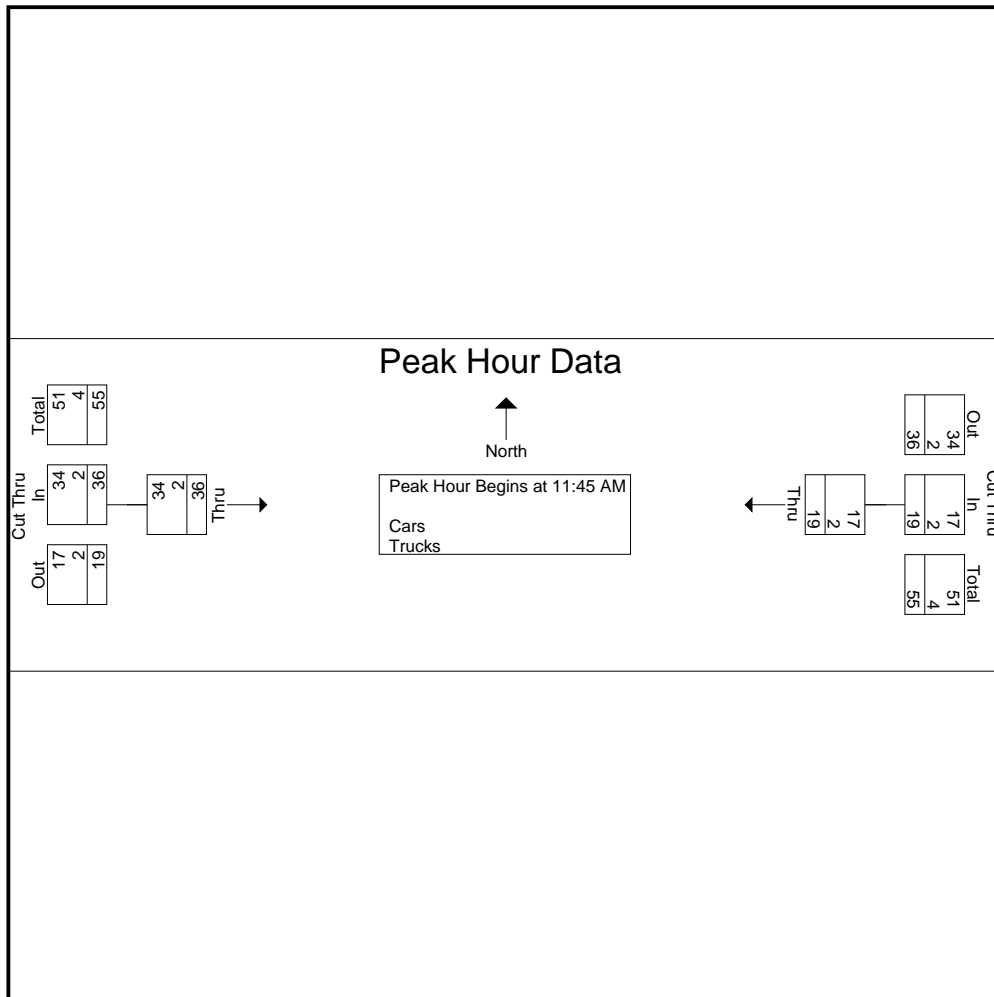
File Name : 160400S2
 Site Code : 16040002
 Start Date : 10/8/2016
 Page No : 2

	Cut Thru From East		Cut Thru From West		
Start Time	Thru	App. Total	Thru	App. Total	Int. Total

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:45 AM

11:45 AM	5	5	9	9	14
12:00 PM	1	1	8	8	9
12:15 PM	4	4	9	9	13
12:30 PM	9	9	10	10	19
Total Volume	19	19	36	36	55
% App. Total	100		100		
PHF	.528	.528	.900	.900	.724
Cars	17	17	34	34	51
% Cars	89.5	89.5	94.4	94.4	92.7
Trucks	2	2	2	2	4
% Trucks	10.5	10.5	5.6	5.6	7.3



STATION 5087 - SALISBURY - RTE. I-95 - AT AMESBURY T.L.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
2005	46132	49196	48814	52617	55609	60966	69820	70125	58099	55109	52277	49737	55,708
2006	46898	48919	50119	52494	53953	60033	68816	69455	62938	60081	52777	51034	56,460
2007	47298	49551	49388	50938	56418	62051	69075	72016	60249	56334	51723	46809	55,988
2008	46083	46713	49000	50084	53634	57752	65270	67898	56570	54805	49755	46827	53,699
2009	44440	46000	47342	51807	55367	57958	66056	70154	58481	54594	50146	48723	54,256
Average:	46,170	48,076	48,933	51,588	54,996	59,752	67,807	69,930	59,267	56,185	51,336	48,626	55,222

Factor to

Annual Avg.:	1.20	1.15	1.13	1.07	1.00	0.92	0.81	0.79	0.93	0.98	1.08	1.14
---------------------	------	------	------	------	------	------	------	------	------	------	------	------

Annual Growth:

2005-2006	1.35%
2005-2007	0.25%
2005-2008	-1.20%
2005-2009	-0.65%
2006-2007	-0.84%
2006-2008	-2.44%
2006-2009	-1.30%
2007-2008	-4.09%
2007-2009	-1.55%
2008-2009	1.04%
Avg. Growth:	-0.94%

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Amesbury COUNT DATE : Sep-16

DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Route 110 (Macy Street)

MINOR STREET(S) : McDonald's Driveways

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	1,079	1,208	111			2,398

" K " FACTOR : **0.085** INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME : **28,212**

TOTAL # OF CRASHES : **14** # OF YEARS : **3** AVERAGE # OF CRASHES PER YEAR (A) : **4.67**

CRASH RATE CALCULATION :

0.45

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : _____

Project Title & Date: 16040/Amesbury

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Amesbury COUNT DATE : Sep-16

DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Route 110 (Macy Street)

MINOR STREET(S) : McDonald's Driveways

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM) :	1,079	1,208	111			2,398

" K " FACTOR :

0.085

INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

28,212

TOTAL # OF CRASHES :

4

OF YEARS :

2

AVERAGE # OF CRASHES PER YEAR (A) :

2.00

CRASH RATE CALCULATION :

0.19

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : _____

Project Title & Date: 16040/Amesbury

Institute of Transportation Engineers (ITE); 9th Edition

Land Use Code (LUC) 934 - Fast-Food Restaurant with Drive-Through Window

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area

Independent Variable (X): 4.214

AVERAGE WEEKDAY DAILY

$$T = 496.12 * (X)$$

$$T = 2,090.65$$

$$T = 2,090 \text{ vehicle trips}$$

with 50% (1,045 vpd) entering and 50% (1,045 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 45.42 * (X)$$

$$T = 191.40$$

$$T = 191 \text{ vehicle trips}$$

with 51% (97 vph) entering and 49% (94 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 32.65 * (X)$$

$$T = 137.59$$

$$T = 138 \text{ vehicle trips}$$

with 52% (72 vph) entering and 48% (66 vph) exiting.

SATURDAY DAILY

$$T = 722.03 * (X)$$

$$T = 3,042.63$$

$$T = 3,040 \text{ vehicle trips}$$

with 50% (1,520 vpd) entering and 50% (1,520 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 59.00 * (X)$$

$$T = 248.63$$

$$T = 249 \text{ vehicle trips}$$

with 51% (127 vph) entering and 49% (122 vph) exiting.

Institute of Transportation Engineers (ITE); 9th Edition

Land Use Code (LUC) 934 - Fast-Food Restaurant with Drive-Through Window

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area

Independent Variable (X): 4.703

AVERAGE WEEKDAY DAILY

$$T = 496.12 * (X)$$

$$T = 2,333.25$$

$$T = 2,330 \quad \text{vehicle trips}$$

with 50% (1,165 vpd) entering and 50% (1,165 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 45.42 * (X)$$

$$T = 213.61$$

$$T = 214 \quad \text{vehicle trips}$$

with 51% (109 vph) entering and 49% (105 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 32.65 * (X)$$

$$T = 153.55$$

$$T = 154 \quad \text{vehicle trips}$$

with 52% (80 vph) entering and 48% (74 vph) exiting.

SATURDAY DAILY

$$T = 722.03 * (X)$$

$$T = 3,395.71$$

$$T = 3,400 \quad \text{vehicle trips}$$

with 50% (1,700 vpd) entering and 50% (1,700 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 59.00 * (X)$$

$$T = 277.48$$

$$T = 277 \quad \text{vehicle trips}$$

with 51% (141 vph) entering and 49% (136 vph) exiting.